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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,190	12/08/2003	Mohamad El-Batal	LSI.80U/S01 (03-1068)	4363
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LSI CORPORATION 1621 BARBER LANE MS: D-106 MILPITAS, CA 95035			EXAMINER KHANNA, MADHU	
			ART UNIT 2151	PAPER NUMBER
			MAIL DATE 04/29/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/731,190

Applicant(s)

EL-BATAL ET AL.

Examiner

MADHU KHANNA

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2008.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-14 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 08 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

1. This communication is in response to Amendment filed 01/17/2008 under 37 C.F.R. §1.111, claims 1-14 have been amended, and claims 1-14 remain pending.
2. Misspelling of the first name for the inventor Mohamad El-Batal has been noted, and the Patent Office records have been corrected.

Claim Rejections - 35 USC § 101

3. Applicant's amendments to claims 7 and 12 in response to the rejection under 35 U.S.C. §101, has been considered. The amendment to the claim obviates previously raised objection, as such these rejections are hereby withdrawn.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1 and 12 recite the limitation "said maximum number of devices" in the third portion of the claim limitation. There is insufficient antecedent basis for this limitation in the claim, as it is not previously mentioned. [AS BEST UNDERSTOOD] For

purposes of examination it will be assumed that a plurality of active devices equals said maximum limit for said number of network addresses.

5. Claim 1 recites the limitation "said at least one network device".

It is not clear if the network device is referring to a spare device or an active device. [AS BEST UNDERSTOOD] For purposes of examination it will be assumed that at least one network device refers to at least one spare device.

Claim Rejections - 35 USC § 103

6. Quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action may be found in the previous office action.

7. Claims 1-2 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen et al. (US Patent # 6,609,213) (referred to as Nguyen hereafter) in view of Swales (US Patent # 6,982,953) and in further view of Wang et al. (US Patent # 6,470,382) (referred to as Wang hereafter).

Regarding claim 1, Nguyen teaches a method for managing more devices on a computer network communications system than permitted by a maximum limit for a

number of network addresses defined by a networking protocol of said computer network communications system comprising:

providing a network communications medium for carrying communications between devices of said computer network communications system such that said network communications medium operates in accordance with said networking protocol (e.g. TCP/IP) of said computer network communications system (column 4 lines 23-28);

providing a plurality of active devices (14a, 14b, 14c and 14d of FIG. 1) that equals number of network addresses (28a, 28b, 28c and 28d of FIG. 1) (storage devices 28 can be grouped into RAID volumes and each volume assigned a SCSI logical unit number (LUN) address, column 5 lines 2-6);

connecting said plurality of active devices (servers 14) to said network communications medium (servers 14 within computer network can transfer data between other servers 14 as well as to and from SAN 26, column 5 lines 10-12);

providing at least one spare device (e.g. cluster server 18 of FIG. 1) such that said at least one spare device (18 of FIG. 1) plus said plurality of active devices (14a-d of FIG. 1) results in a total number of system devices (18, 14a, 14b, 14c and 14d of FIG. 1) that exceeds said number of network addresses (28a, 28b, 28c and 28d), said at least one spare device having a network address value (virtual servers possess an IP address, column 6 lines 1-3);

operating said computer network communications system with said plurality of active devices (servers 14 within computer network 14 can transfer data between other servers 14 as well as to and from SAN 26, column 5 lines 10-12);

determining that at least one of said plurality of active devices (server 14) has failed and has become at least one failed device (e.g. if server 14 does not respond within a specified period of time, then this inability to respond indicates that server 14 is failing and will be unable to serve its associated users, column 5 lines 34-37);

disconnecting said at least one failed device from said network communications medium (e.g. take the failing server 14a offline, column 6 lines 63-64), said at least one failed device having a first address (e.g. LUNs owned by the failing server 14, column 5 line 45);

connecting said at least one spare device (e.g. recover group 44a) to said network communications medium (recovery group 44a will be brought online, column 6 line 23-25);

setting said network address value (LUNs) of said at least one spare device (e.g. cluster server 18) to said first address by said at least one spare device (reassigns the LUNs owned by the failing server 14 to cluster server 18, column 5 lines 45-49); and

operating said computer network communications system with said at least one spare device (cluster server 18) in place of said at least one failed device (failing server 14) (column 5 lines 52-55). However, although Nguyen teaches a spare server assuming the identity of a failing server, Nguyen does not explicitly disclose the spare device determining an unallocated address after the failed device is disconnected from the network communications medium.

Swales teaches at least one spare device (working device) determining an unallocated network address that is not used by another device (as soon as the failed

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device 100 is replaced with a working device 110, the working device 110 requests a network assignment, column 14 lines 35-37) connected to said network communications medium (e.g. the term network refers to any communication exchange, column 14 lines 5-7) and said at least one spare device (new device 110) using said unallocated network address as said network address value for said at least one spare device (issues the same IP address as the previous device and the new device 110 begins operating on the network, column 14 lines 41-43) after at least one of said plurality of active devices (e.g. faulty unit 100) is disconnected from said network communications medium (removed the faulty unit 100, column 15 line 31) and said at least one spare device (replacement device 110) is connected to said network communications medium (installed a replacement device, column 15 lines 31-32);

determining said first address as unallocated by said at least one spare device (the replacement device 110 issues a BOOTP request, column 15 line 32-33).

It would have been obvious to one of ordinary skill in the art at the time of the claimed invention to utilize disconnecting a failed device and then requiring the spare device to determine an unallocated network address in the system/method of Nguyen as suggested by Swales in because in doing so any of the virtual servers could be used to replace any given failed server, interchangeably. One would be motivated to combine these teachings because if every server did not utilize its own corresponding virtual server, than the system/method would operate using less virtual servers, resulting in an improved use of resources. However, Nguyen-Swales do not explicitly disclose a maximum limit for the number of network address or setting an individual

address value of each of the plurality of active devices to an unallocated network address.

Wang teaches providing a network architecture having a maximum number of network addresses corresponding to said maximum limit for said number of network addresses for said networking protocol of said computer network communications system (e.g. SCSI address limitation, column 6 lines 60-65);

setting an individual address value (SCSI-ID/Logical Unit Number (LUN) of each of said plurality of active devices (netSCSI device) to an unallocated network address (column 9 lines 24-26).

It would have been obvious to one of ordinary skill in the art at the time of the claimed invention to recognize that a network, such as in the system/method of Nguyen-Swales, is restricted by a limitation such as the quantity of unique address as described by Wang. One of ordinary skill would recognize that a system can ideally manage a maximum quantity of devices limited only by these address restrictions. One would be motivated to combine these teachings because setting an individual address for each operating device allows each device to be distinguished from other devices during intercommunications.

Regarding claim 2, Wang teaches the method of claim 1 wherein said process of setting said individual address value (e.g. Logical SCSI-ID) of each of said plurality of active devices (netSCSI device) to an unallocated network address further comprises assigning a predetermined address (e.g. 1) for at least one of said plurality of active

devices (e.g. if netSCSI 310A was the first device to be attached to the network 300A, Server 302A would map netSCSI 310A to Logical SCSI-ID. 1 because that is the first device that server 302A has mapped, column 10 lines 38-42).

Regarding claim 12, this computer network communication system claim comprises limitation(s) substantially the same as those discussed on claim 1 above, same rationale of rejection is applicable, wherein the method steps further comprise the modules for performing respective function/steps discussed therein, same rationale of rejections is applicable.

8. Claims 3-8, 10-11 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen-Swales-Wang in view of Hanan et al. (US Patent # 6,792,486) (referred to as Hanan hereafter).

Regarding claim 3, Nguyen-Swales-Wang do not explicitly disclose switches, connected to a controller, adapted to connect and disconnect each device to and from the network communications medium.

Hanan teaches the method of claim 1 further comprising:

providing a plurality of switches such that each switch of said plurality of switches connects (switch in) and disconnects (switch out) a device (disk drive) to and from said network communications medium (column 12 lines 19-24);

attaching each switch of said plurality of switches to each of said plurality of active devices and to said at least one spare device (each of the plural disk drives in the system 100 has an associated switch 130, column 3 lines 47-52); and

connecting each switch of said plurality of switches to a controller (switch controller 101) that controls said plurality of switches (column 12 lines 19-24).

It would have been obvious to one of ordinary skill in the art at the time of the claimed invention to utilize individual switches to connect and disconnect devices to and from the network in the system/method of Nguyen-Swales-Wang as suggested by Hanan because doing so would cause the failover procedure of bringing a recovery group online to take the role of a failed device to be carried out more smoothly. One of ordinary skill would recognize that disconnecting, or bring the failed device offline, would allow for easier repair or troubleshooting of the device. One would be motivated to combine these teachings because it would result in an automatic swapping of devices, eliminating the need for maintenance personnel to remove the failed device.

Regarding claim 4, Nguyen teaches the method of claim 3 wherein said process of determining that at least one of said plurality of active devices has failed (e.g. monitors the status of server 14 by sending out heartbeat signals at regular intervals) and has become at least one failed device is performed by said controller (this heartbeat mechanism may be implemented by the storage consolidation software, or any other suitable software or instrumentality, column 5 lines 18-23).

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Regarding claim 5, Hanan teaches the method of claim 4 wherein said plurality of active devices and said at least one spare device comprises a plurality of data storage devices (column 3 lines 24-34).

Regarding claim 6, Hanan teaches the method of claim 5 wherein said plurality of active devices are arranged as at least a portion of a RAID system (column 15 lines 19-28).

Regarding claim 7, this computer network communications system claim comprises limitation(s) substantially the same as those discussed on claim 1 above, same rationale of rejection is applicable. However, Hanan teaches further limitations comprising:

a plurality of switches attached to each of said plurality of active devices and to said at least one spare device (column 3 lines 47-52) that connects (switch in) and disconnects (switch out) each of said plurality of active devices and said at least one spare device to and from said network communications medium (column 12 lines 19-24); and

a controller (switch controller 101) that controls each of said plurality of switches such that switches attached to each of said plurality of active devices (e.g. first element) are connected to said network communications medium until such time said controller causes an unwanted active device to be disconnected from said network communications medium by turning off at least one of said switches (switch out) attached to each of said plurality of active devices (upon failure detection, switch

controller 101 can use switch control processor 102 to instruct scan controller 104 to switch out the failed drive of first element, column 12 lines 19-22) and said controller then causing said at least one spare device (e.g. disk drive from the third element) to be connected to said network communications medium by turning on a switch (switch in) of said plurality of switches attached to said at least one spare device (switch in a disk drive from third element 180 (i.e., the "spares" element) to replace the failed or otherwise non-responsive disk drive, column 12 lines 22-24).

Regarding claim 8, Nguyen teaches the computer network communications system of claim 7 wherein said controller further:

assesses a status of each of said plurality of active devices (monitors the status of server 14 by sending out heartbeat signals at regular intervals to servers 14; this heartbeat mechanism may be implemented by the storage consolidation software, or any other suitable software or instrumentality, column 5 lines 18-23);

determines that one of said plurality of active devices is improperly functioning as a failed device (if the server 14 does not respond within a specified period of time, then this inability to respond indicates that server 14 is failing and will be unable to serve its associated users, column 5 lines 34-37);

Hanan teaches where said controller further:

causes a first switch of said plurality of switches to disconnect (switch out) said failed device from said network communications medium (column 12 lines 19-22); and

causes a second switch of said plurality of switches to connect (switch in) said at least one spare device ("spares" element) to said network communications medium (column 12 lines 22-24).

Regarding claim 10, this computer network communications system claim comprises limitation(s) substantially the same as those discussed on claim 5 above, same rationale of rejection is applicable.

Regarding claim 11, this computer network communications system claim comprises limitation(s) substantially the same as those discussed on claim 6 above, same rationale of rejection is applicable.

Regarding claim 13, this computer network communications system claim comprises limitation(s) substantially the same as those discussed on claim 5 above, same rationale of rejection is applicable, wherein the method steps further comprise the modules for performing respective function/steps discussed therein, same rationale of rejections is applicable.

Regarding claim 14, Hanan teaches the computer network communications system of claim 13 wherein a plurality subset (at least one of the first and second elements) of

said plurality of active devices first means are arranged as a RAID system (column 15 lines 19-28).

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen-Swales-Wang-Hanan in view of Corrington et al. (US Patent # 6,076,142) (referred to as Corrington hereafter).

Regarding claim 9, although Hanan discloses a system reset or re-boot (Hanan: column 12 lines 50-53), and Wang discloses a device having to reboot after initial attachment and assignment is completed (Wang: column 19 lines 58-60), the above mentioned prior art do not explicitly teach where the controller is adapted to reset the network/system.

Corrington teaches the computer network communications system of claim 8 wherein said controller further resets said computer network communications system (column 17 lines 35-37).

It would have been obvious to one of ordinary skill in the art at the time of the claimed invention to utilize the controller resetting the system in the system/method of Nguyen-Swales-Wang-Hanan as suggested by Corrington in order to re-initialize the system with its new connections and settings. One would be motivated to combine these teachings because the same controller used for monitoring devices and

controlling the switches would be additionally capable of resetting or rebooting the network when necessary.

Response to Arguments

10. Regarding claim 1, 7 and 12, it is argued that the applied references teach away from the claimed limitations as amended. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection necessitated by the amendments.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MADHU KHANNA whose telephone number is (571)270-3629. The examiner can normally be reached on Monday-Thursday 8:30-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Follansbee can be reached on 571-272-3964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. K./
Examiner, Art Unit 2151

/John Follansbee/

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